

# DRILLED MEDIUM, MANUFACTURING METHOD THEREFOR AND VERIFICATION METHOD USING MEDIUM

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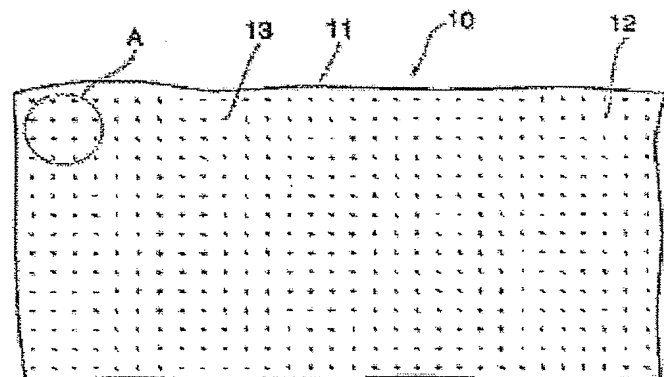
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## Abstract of JP2003312175

**PROBLEM TO BE SOLVED:** To provide a drilled medium more enhanced in forgery preventing effect by developing a verification pattern capable of verifying predetermined regular clearly different genuineness by the difference of the projection direction of irradiation light to a medium such as securities or the like requiring security or a medium looking angle (verification angle) or the like.

**SOLUTION:** The medium 10 is the drilled one equipped with slots 12 and 13 being fine holes showing a long shape with respect to the width of each hole. This medium is equipped with a plurality of slot forming regions formed by gathering one or more slots and the slots formed to a plurality of regions among the slot forming regions show isotropy turned unidirectionally in its longitudinal direction or anisotropy turned in different two directions.

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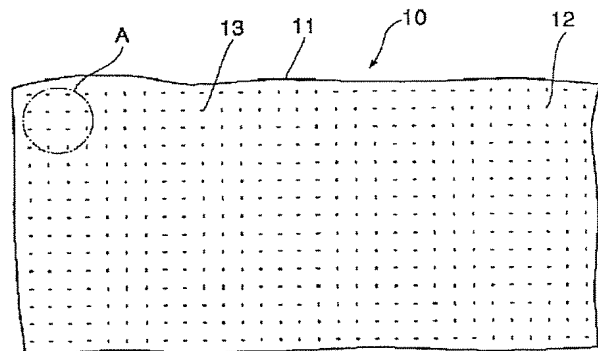
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(54) 【発明の名称】 穿孔付き媒体及び媒体の製造方法及び媒体を用いた検証方法

(57) 【要約】

【課題】セキュリティを必要とする有価証券等の媒体に対する照射光の投光方向の相違や、媒体を見る角度（検証角度）等によって、所定の規則的な明確に異なる真偽を検証可能な検証パターンを出現させることにより、より偽造防止効果が高い媒体を提供する。

【解決手段】媒体10を正面側から見たとき、幅に対して長さが長い形状を呈する微細な孔である長孔12、13を備えた穿孔付き媒体であって、長孔を1つ以上集合して形成した1乃至2以上複数の長孔形成領域を備え、該領域のうち1乃至2以上複数の領域に形成された長孔が、その長手方向を一方向に向けた等方性又は異なる二方向に向けた異方性を呈している。



ことを特徴とする穿孔付き媒体である。

【0007】本発明の請求項2に係る発明は、媒体を正面側から見たとき、幅に対して長さが長い形状を呈する微細な孔である長孔を備えた穿孔付き媒体であって、少なくとも、前記長孔を2つ以上集合して形成した1乃至2以上複数の長孔形成領域を備え、該領域のうち1乃至2以上複数の領域に形成された長孔が、その長手方向を異なる二方向に向けた異方性を呈していることを特徴とする穿孔付き媒体である。

【0008】本発明の請求項3に係る発明は、媒体を正面側から見たとき、幅に対して長さが長い形状を呈する微細な孔である長孔を備えた穿孔付き媒体であって、少なくとも、前記長孔を1つ以上集合して形成した1乃至2以上複数の長孔形成領域を備え、該領域のうち1乃至2以上複数の領域に形成された長孔が、その長手方向を一方向に向けた等方性を呈し、且つ該領域内に幅に対して長さがほぼ等しい形状を呈する微細な孔である点孔が1つ以上集合して形成されていることを特徴とする穿孔付き媒体である。

【0009】本発明の請求項4に係る発明は、媒体を正面側から見たとき、幅に対して長さが長い形状を呈する微細な孔である長孔を備えた穿孔付き媒体であって、少なくとも、前記長孔を2つ以上集合して形成した1乃至2以上複数の長孔形成領域を備え、該領域のうち1乃至2以上複数の領域に形成された長孔が、その長手方向を異なる二方向に向けた異方性を呈し、且つ該領域内に幅に対して長さがほぼ等しい形状を呈する微細な孔である点孔が1つ以上集合して形成されていることを特徴とする穿孔付き媒体である。

【0010】本発明の請求項5に係る発明は、上記請求項1乃至4のいずれか1項に係る穿孔付き媒体において、前記長孔が、所定パターンに見えるように配置してあることを特徴とする穿孔付き媒体である。

【0011】本発明の請求項6に係る発明は、上記請求項1乃至請求項5のいずれか1項に係る穿孔付き媒体又は該媒体の正当な所有者に関わる固有の情報を含む固有情報、あるいは前記穿孔付き媒体の金銭的な価値を示す金銭的情報、あるいは、前記穿孔付き媒体の正当な所有者が享受を許される待遇を示す待遇的情報のうち、いずれか少なくとも1以上の情報が、前記長孔又は／及び点孔により識別可能に記録されていることを特徴とする穿孔付き媒体である。

【0012】本発明の請求項7に係る発明は、上記請求項1乃至請求項6のいずれか1項に係る穿孔付き媒体の前記長孔をレーザーを用いて穿孔することにより形成することを特徴とする穿孔付き媒体の製造方法である。

【0013】本発明の請求項8に係る発明は、上記請求項3乃至請求項6のいずれか1項に係る穿孔付き媒体の前記点孔をレーザーを用いて穿孔することにより形成することを特徴とする穿孔付き媒体の製造方法である。

【0014】本発明の請求項9に係る発明は、上記請求項1乃至請求項6のいずれか1項に係る穿孔付き媒体の前記長孔及び点孔をレーザーを用いて穿孔することにより形成することを特徴とする穿孔付き媒体の製造方法である。

【0015】本発明の請求項10に係る発明は、上記請求項1乃至請求項6のいずれか1項に係る穿孔付き媒体の真偽検証方法であって、前記穿孔付き媒体に、垂直方向から光照射して前記長孔又は／及び点孔を透過する透過光による像と、斜め方向から光照射して前記長孔又は／及び点孔を透過する透過光による像との比較結果を用いて検証を行うことを特徴とする穿孔付き媒体の真偽検証方法である。

【0016】

【発明の実施の形態】本発明の実施の形態を、以下に詳細に説明する。図1は、本発明の穿孔付き媒体10における、幅に対して長さが長い形状を呈する微細な孔である長孔12、13の集合による穿孔パターンの例である。

【0017】また、図2は、図1の穿孔付き媒体における穿孔パターンの形成領域Aの拡大図である。また、図3は、図2の穿孔付き媒体の穿孔パターンの形成領域Aにおける線分X-Yの断面図である。また、図4は、穿孔付き媒体における穿孔パターン検証時に現れる検証パターンの例を示す。

【0018】本発明の穿孔付き媒体10は、図1に示すように、その媒体10を正面側から見たとき、幅に対して長さが長い形状（長方形、長円形、楕円形など）を呈する微細な孔である縦方向の長孔12及び横方向の長孔13を備えている。

【0019】そして、本発明の穿孔付き媒体10は、少なくとも、前記縦方向の長孔12及び横方向の長孔13を1つ以上集合して形成した1乃至2以上複数の長孔形成領域を備え、該領域のうち1乃至2以上複数の領域に形成された長孔は、その長手方向を縦方向又は横方向のうちのいずれか一方向に向けた等方性を呈しているものである。

【0020】また、本発明の穿孔付き媒体10は、少なくとも、前記縦方向の長孔12及び横方向の長孔13を2つ以上集合して形成した1乃至2以上複数の長孔形成領域を備え、該領域のうち1乃至2以上複数の領域に形成された長孔は、その長手方向を縦方向と横方向の異なる二方向に向けた異方性を呈しているものである。

【0021】また、図1に示す本発明の穿孔付き媒体10には、1乃至2以上複数の長孔形成領域内に、幅に対して長さがほぼ等しい形状（正方形、真円形など）を呈する微細な孔である点孔（図示せず）が1つ以上混在して形成されているか、あるいは、その点孔が2つ以上集合して混在して形成されているものである。

【0022】また、図1に示す本発明の穿孔付き媒体1

光  $L_1$  を他面側から観測した場合には、B地点の縦方向の姿勢となった長孔 13 からは照明光  $L$  の一部が透過光  $L_1$  として透過し、C地点の横方向の姿勢となった長孔 12 からは照明光  $L$  は透過しない。

【0037】そのため、 $90^\circ$  回転させた後の媒体 10 は、縦方向の姿勢となった個々の長孔 13 のみを透過した透過光  $L_1$  が像（パターン）として他面側にて検証パターンとして観察されて、例えば、図 4 に示す画像「100」のポジパターンに対するネガパターン（画線部の反転したパターン）が、検証パターンとして検出される。

【0038】

【実施例】以下に、本発明の具体的な実施例について説明する。

【0039】＜実施例 1＞厚さ  $100\ \mu\text{m}$  の紙製基材 11 に印刷等を施して形成した商品券に、CO<sub>2</sub> ガスレーザを用いて、幅  $60\ \mu\text{m}$ 、長さ  $200\ \mu\text{m}$  の線分状の多数の長孔を 2 次元配列的に規則的に縦方向と横方向に穿孔して穿孔パターンを形成して、本発明の穿孔付き媒体を得た。

【0040】

【発明の効果】本発明の穿孔付き媒体は、媒体の観察側とは反対側から照明光を照射し、その媒体面に対する観察視線が垂直方向となるようにして媒体を真正面から見た場合には、媒体に穿孔した全ての長孔を照明光が透過して、規則的で均一な穿孔パターンとして観察され、また、所定検出手段によりそのように検出されるが、媒体\*

\*面に対する観察視線が所定の角度（検証角度）となるようにして、媒体を傾けて見た場合には、縦方向と横方向で区別された所定のパターンが、真偽を判定するための検証パターンとして現出するものであり、商品券等の有価証券の偽造防止に効果的である。

【0041】このように、本発明は、セキュリティを必要とする有価証券等の媒体に対する照射光の投光方向の相違や、媒体を見る角度（検証角度）等によって、所定の規則的な明確に異なる検証パターンを出現させることにより、真偽を検証可能であり、偽造防止効果の高い媒体を提供することを可能とする。

【図面の簡単な説明】

【図 1】本発明の穿孔付き媒体における微細な長孔の集合による穿孔パターンの一例を示す平面図。

【図 2】本発明の穿孔付き媒体における穿孔パターンの形成領域 A の拡大図。

【図 3】本発明の穿孔付き媒体の穿孔パターンの形成領域 A における線分 X-Y の断面図。

【図 4】本発明の穿孔付き媒体における穿孔パターン検証時に現れる検証パターンの一例を示す平面図。

【符号の説明】

A…穿孔パターンの一部形成領域 B…地点 C…地点

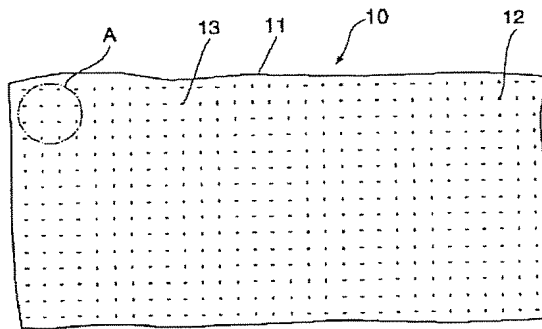
L…照明光  $L_1$ …透過光

10…穿孔付き媒体 11…シート状の基材 12…縦方向の長孔

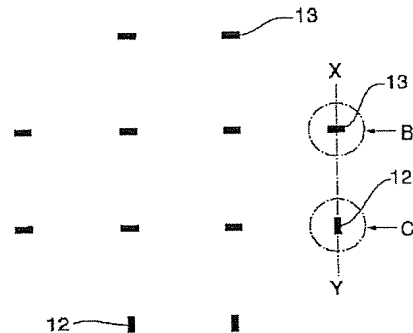
13…横方向の長孔

20…検証パターン 21…長孔を透過した点光

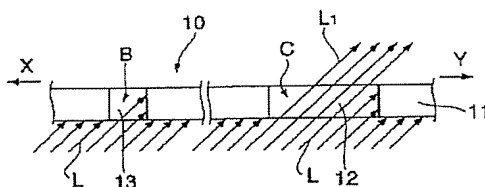
【図 1】



【図 2】



【図 3】



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#### CLAIMS [Claim(s)]

[Claim 1] When a medium is seen from the transverse-plane side, it is the medium with punching provided with a long hole which is a detailed hole which presents shape where length is long, to width, A medium with punching, wherein a long hole which was provided with a long hole formation area of 1 thru/or more than 2 plurality which gathered and formed said one or more long holes at least, and was formed in 1 thru/or a field of more than 2 plurality among these fields is presenting isotropy which turned the longitudinal direction to one way.

[Claim 2] When a medium is seen from the transverse-plane side, it is the medium with punching provided with a long hole which is a detailed hole which presents shape where length is long, to width, A medium with punching currently presenting anisotropy to which a long hole which was provided with a long hole formation area of 1 thru/or more than 2 plurality which gathered and formed said two or more long holes at least, and was formed in 1 thru/or a field of more than 2 plurality among these fields turned the longitudinal direction for different two way types.

[Claim 3] When a medium is seen from the transverse-plane side, it is the medium with punching provided with a long hole which is a detailed hole which presents shape where length is long, to width, It has a long hole formation area of 1 thru/or more than 2 plurality which gathered and formed said one or more long holes at least, A medium with punching, wherein one or more point holes which are detailed holes which a long hole formed in 1 thru/or a field of more than 2 plurality among these fields presents isotropy which turned the longitudinal direction to one way, and present shape where length is almost equal to width, in this field gather and are formed.

[Claim 4] When a medium is seen from the transverse-plane side, it is the medium with punching provided with a long hole which is a detailed hole which presents shape where length is long, to width, It has a long hole formation area of 1 thru/or more than 2 plurality which gathered and formed said two or more long holes at least, A medium with punching, wherein one or more point holes which are detailed holes which present anisotropy which a long hole formed in 1 thru/or a field of more than 2 plurality among these fields turned for two way types which are different in the longitudinal direction, and present shape where length is almost equal to width in this field gather and are formed.

[Claim 5] A medium with punching of claim 1 thru/or 4 arranging said long hole so that it may be visible to a prescribed pattern given in any 1 paragraph.

[Claim 6] Characteristic data including peculiar information in connection with a just owner of a medium with punching of claim 1 thru/or claim 5 given in any 1 paragraph, or this medium, Or pocketbook information which shows pocketbook worth of said medium with punching, Or a medium with punching even if small [ either ] among treatment information that a just owner of said medium with punching shows treatment allowed enjoyment, wherein one or more information is recorded by said long hole or/and point hole identifiable.

[Claim 7] A manufacturing method of a medium with punching forming by punching said long hole of a medium with punching of claim 1 thru/or claim 6 given in any 1 paragraph using laser.

[Claim 8] A manufacturing method of a medium with punching forming by punching said point hole of a medium with punching of claim 3 thru/or claim 6 given in any 1 paragraph using laser.

[Claim 9] A manufacturing method of a medium with punching forming by punching said long hole and a point hole of a medium with punching given in any 1 paragraph of claim 1 thru/or claim 6 using laser.

[Claim 10] An image by the transmitted light which is a truth verification method of a medium with punching of claim 1 thru/or claim 6 given in any 1 paragraph, carries out an optical exposure from a perpendicular direction, and penetrates said long hole or/and a point hole to said medium with punching, A truth verification method of a medium with punching verifying using a comparison result with an image by the transmitted light which carries out an optical exposure from an oblique direction, and penetrates said long hole or/and a point hole.

#### DETAILED DESCRIPTION [Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to a medium with punching, a manufacturing method for the same, and a truth verification method for the same of the sake on much more security disposition about the medium which needs security nature, such as negotiable securities.

[0002]

[Description of the Prior Art] The medium and bill which need security nature, such as negotiable securities, conventionally, Open two or more detailed holes in substrates, such as a card and a passport, form a picture in them, and a verification pattern is made to appear in them by the transmitted light which penetrates a detailed hole, and they have a medium with punching which was made to perform truth judgement by verifying the pattern.

[0003] However, in the above conventional methods, since the detailed hole was only opened simply, in the picture by the floodlighting direction of the irradiation light for forming the picture by the transmitted light, and the direction which looks at an observation direction etc., the regular change according to a predetermined rule is not produced.

[0004]Therefore, in verification of the truth of media, such as negotiable securities, by the conventional method, there is a field which lacks in accuracy or minute nature, and much more improvement in the security nature by a medium method with punching was desired.

[0005]

[The issue which is going to solve a problem] In this invention, with then, a difference of the floodlighting direction of the irradiation light to media, such as negotiable securities which need security, the angle (verification angle) which looks at a medium, etc. Let it be a technical problem to provide a medium with a higher forgery prevention effect by making the verification pattern which can verify regular clearly different predetermined truth appear.

[0006]

[Means for Solving the Problem]An invention concerning claim 1 of this invention is the medium with punching provided with a long hole which is a detailed hole which length presents long shape to width, when a medium is seen from the transverse-plane side, A long hole which was provided with a long hole formation area of 1 thru/or more than 2 plurality which gathered and formed said one or more long holes at least, and was formed in 1 thru/or a field of more than 2 plurality among these fields is the medium with punching currently presenting isotropy which turned the longitudinal direction to one way.

[0007]An invention concerning claim 2 of this invention is the medium with punching provided with a long hole which is a detailed hole which length presents long shape to width, when a medium is seen from the transverse-plane side, A long hole which was provided with a long hole formation area of 1 thru/or more than 2 plurality which gathered and formed said two or more long holes at least, and was formed in 1 thru/or a field of more than 2 plurality among these fields is the medium with punching currently presenting anisotropy which turned the longitudinal direction for different two way types.

[0008]An invention concerning claim 3 of this invention is the medium with punching provided with a long hole which is a detailed hole which length presents long shape to width, when a medium is seen from the transverse-plane side, It has at least a long hole formation area of 1 thru/or more than 2 plurality which gathered and formed said one or more long holes, It is a medium with punching, wherein one or more point holes which are detailed holes which a long hole formed in 1 thru/or a field of more than 2 plurality among these fields presents isotropy which turned the longitudinal direction to one way, and present shape where length is almost equal to width, in this field gather and are formed.

[0009]An invention concerning claim 4 of this invention is the medium with punching provided with a long hole which is a detailed hole which length presents long shape to width, when a medium is seen from the transverse-plane side, It has at least a long hole formation area of 1 thru/or more than 2 plurality which gathered and formed said two or more long holes, It is a medium with punching, wherein one or more point holes which are detailed holes which present anisotropy which a long hole formed in 1 thru/or a field of more than 2 plurality among these fields turned for two way types which are different in the longitudinal direction, and present shape where length is almost equal to width in this field gather and are formed.

[0010]In a medium with punching concerning any 1 paragraph of above-mentioned claims 1 thru/or 4, an invention concerning claim 5 of this invention is a medium with punching arranging said long hole so that it may be visible to a prescribed pattern.

[0011]Characteristic data including peculiar information in connection with a just owner of a medium with punching which requires an invention concerning claim 6 of this invention for any 1 paragraph of above-mentioned claim 1 thru/or claim 5, or this medium, Or, pocketbook information which shows pocketbook worth of said medium with punching, Or, even if small [either] among treatment information that a just owner of said medium with punching shows treatment allowed enjoyment, one or more information is the media with punching characterized by what is recorded by said long hole or/and point hole identifiable.

[0012]An invention concerning claim 7 of this invention is a manufacturing method of a medium with punching forming by punching said long hole of a medium with punching concerning any 1 paragraph of above-mentioned claim 1 thru/or claim 6 using laser.

[0013]An invention concerning claim 8 of this invention is a manufacturing method of a medium with punching forming by punching said point hole of a medium with punching concerning any 1 paragraph of above-mentioned claim 3 thru/or claim 6 using laser.

[0014]An invention concerning claim 9 of this invention is a manufacturing method of a medium with punching forming by punching said long hole and a point hole of a medium with punching concerning any 1 paragraph of above-mentioned claim 1 thru/or claim 6 using laser.

[0015]An invention concerning claim 10 of this invention is a truth verification method of a medium with punching concerning any 1 paragraph of above-mentioned claim 1 thru/or claim 6, It is a truth verification method of a medium with punching verifying using a comparison result of an image by the transmitted light which carries out an optical exposure from a perpendicular direction, and penetrates said long hole or/and a point hole to said medium with punching, and an image by the transmitted light which carries out an optical exposure from an oblique direction, and penetrates said long hole or/and a point hole.

[0016]

[Embodiment of the Invention]An embodiment of the invention is described in detail below. Drawing 1 is an example of the hole pattern by set of the long holes 12 and 13 which are detailed holes in the medium 10 with punching of this invention which present the shape where length is long, to width.

[0017]Drawing 2 is an enlarged drawing of the formation area A of the hole pattern in the medium with punching of drawing 1. Drawing 3 is a sectional view of line segment X-Y in the formation area A of the hole pattern of the medium with punching of drawing 2. Drawing 4 shows the example of the verification pattern which appears at the time of the hole pattern verification in a medium with punching.

[0018]The medium 10 with punching of this invention is provided with the long hole 12 of a lengthwise direction and the lateral long hole 13 which are detailed holes which present the shape (a rectangle, an ellipse, an ellipse form, etc.) where length is long, to width when the medium 10 is seen from the transverse-plane side, as shown in drawing 1.

[0019]And the medium 10 with punching of this invention is provided with the long hole formation area of 1 thru/or more than 2 plurality which gathered and formed the long hole 12 of said lengthwise direction, and the one or more lateral long holes 13 at least, The long hole formed in 1 thru/or the field of more than 2 plurality among these fields is presenting the isotropy which turned the longitudinal direction in the any 1 direction of [ of a lengthwise direction or the transverse directions ].

[0020]The medium 10 with punching of this invention is provided with the long hole formation area of 1 thru/or more than 2 plurality which gathered and formed the long hole 12 of said lengthwise direction, and the two lateral long holes 13 or more at least, The long hole formed in 1 thru/or the field of more than 2 plurality among these fields is presenting the anisotropy which turned the longitudinal direction for the two way types with which a lengthwise direction differs from a transverse direction.

[0021]To the medium 10 with punching of this invention shown in drawing 1. In the long hole formation area of 1 thru/or more than 2 plurality, one or more point holes (not shown) which are detailed holes which length presents almost equal shape (a square, a round shape, etc.) to width are intermingled, and it is formed, or it gathers, and the two or more point holes are intermingled, and are formed.

[0022]To the medium 10 with punching of this invention shown in drawing 1. The long hole formed in the field of 1 thru/or more than 2 plurality among the long hole formation areas of 1 thru/or more than 2 plurality, Present the anisotropy turned for the isotropy which turned the longitudinal direction to one way, or different two way types, and in the field of this isotropy or anisotropy, It is intermingled and formed, or the two or more point holes gather, it is intermingled, and one or more point holes (not shown) which are detailed holes which length presents almost equal shape to width are formed.

[0023]As shown in drawing 1, the medium 10 with punching of this invention to the sheet shaped substrate 11. By punching the long hole (installed light transmission hole) of the isotropic shape of a detailed line segment which turned the longitudinal direction by either the long hole 12 of a lengthwise direction, or the lateral long hole 13 to one way, a hole pattern is formed in two-dimensional array, and the medium 10 with punching is created.

[0024]As shown in drawing 1, the medium 10 with punching of this invention to the sheet shaped substrate 11. By punching the long hole (installed light transmission hole) of the shape of a line segment with detailed anisotropy which turned the longitudinal direction by the long hole 12 of a lengthwise direction, and the lateral long hole 13 for two way types different, respectively, a hole pattern is formed in two-dimensional array, and the medium 10 with punching is created.

[0025]The medium 10 with punching of this invention equips the substrate 11 with the long hole formation area of 1 thru/or more than 2 plurality which gathered and carried out punching formation of either [ one or more ] the long hole 12 of said lengthwise direction, or the lateral long hole 13 at least, The longitudinal direction of the long hole formed in 1 thru/or the field of more than 2 plurality among these fields is presenting the isotropy which turned to one direction.

[0026]It will not ask, especially if resin, a metal plate, a metallic foil, paper, etc. are processible into a sheet shaped, it is stabilized, and a hole can be opened and shape can be maintained as the substrate 11 used here.

[0027]put on a hole to the substrate 11 -- as \*\*\*\*\* , the processing method of contact methods, such as a needle and a cookie cutter, can be used, and also the processing method of noncontact methods, such as laser, an electron beam, and an ion beam, can be used.

[0028]put on a hole to the substrate 11 in a contact method -- the periphery of the hole by the side of a rear face projecting to the \*\*\*\* direction, or it generating with common, and in the \*\* case, What is called a barricade may occur; therefore it is difficult in respect of processing, and in the electron beam and ion beam of a noncontact method, since a processing device becomes need to decompress processing environment and large-scale, processing by laser is preferred.

[0029]put on a hole as laser which can be used -- if an oscillation wavelength and output intensity suitable for \*\*\*\*\* 11 are obtained, it will not ask in particular. The carbon dioxide gas laser from these points and a neodymium YAG laser are suitable.

[0030]In this invention, as shown in drawing 2 which expanded the portion of the hole pattern formation area A in drawing 1 and drawing 1, the long hole 12 of a line segment-like lengthwise direction and the lateral long hole 13 are formed in the substrate 11 in two-dimensional array, and the medium 10 with punching in which the hole pattern was formed is created.

[0031]When the visible light for lighting (available light, such as electric light source lights, such as a lamp for lighting, tonneau-light light, or sunlight) is vertically floodlighted from the front to that substrate 11 to this medium 10, Since each long holes 12 and 13 are detailed, distinction of the long hole of a lengthwise direction and a lateral long hole is not attached easily, and it is visible to the directivity of a hole with the hole arranged uniformly independently.

[0032]However, as shown in drawing 3 showing the section of the one long hole 13 of the transverse direction of B point in X-Y of drawing 2, and the one long hole 12 of the lengthwise direction of C point, The medium 10 is tilted at a predetermined angle (verification angle) to an observer's look (look to the transverse-plane front). The whole surface of the medium 10 is irradiated with the illumination light L (a beam, isotropic light flux, or the diffused light) from the observation look and the direction which counters (a right pair or \*\*\*\*). When the transmitted light L1 which penetrated the hole pattern of the medium 10 is observed from a side on the other hand, Since the illumination light L does not penetrate in the case of the long hole 13 of the transverse direction of B point but a part penetrates the illumination light L as the transmitted light L1 in the case of the long hole 12 of the lengthwise direction of C point, the image (pattern) constituted by set of the point source of the transmitted light L1 which penetrated only each long hole 12 formed in the medium 10 in the lengthwise direction -- the medium 10, as it is observed as a verification pattern in a side on the other hand, for example, is shown in drawing 4, The picture "100" as an image (pattern) constituted by set of the point source 21 of the transmitted light L1 which penetrated only each long hole 12 is detected by predetermined picture (pattern shape) detection means, such as viewing or CCD, as the verification pattern 20.

[0033]In this invention, without leaning the medium 10, the medium 10 is installed so that an observer's look (look to the transverse-plane front) may become vertical to the 10th page of a medium, As it irradiates with the illumination light L from a predetermined angle (verification angle) to the medium 10 and an observer's look (look to the transverse-plane front), a verification pattern is observed and it may be made to detect it.

[0034]put on to the substrate 11 of the medium 10 -- although the \*\*\*\*\*-like the width and length of the long holes 12 and 13 are based also on setting out of the verification angle of the sheet thickness (for example, thickness of paper) of the substrate 11,

and the medium 10 when verifying the hole pattern by which punching formation was carried out, 1 or more times of width are suitable for length at 1 of the thickness of the substrate 11 / about 2 to 2 times.

[0035]In the medium 10 with punching of this invention, if 90 degrees of two-dimensional sides of the medium 10 are rotated focusing on an axis vertical to the field, The length and the side of a posture of the long holes 12 and 13 are reversed, the long hole 13 of the transverse direction of B point shown in drawing 2 serves as a posture of a lengthwise direction, and the long hole 12 of the lengthwise direction of C point serves as a lateral posture. [ of a longitudinal direction ]

[0036]And an observer's look (look to the transverse-plane front) is received in the medium 10 after rotating 90 degrees such, Tilt at the same angle (verification angle) as the above, and the whole surface of the medium 10 is irradiated from the direction which carries out the right opposite of the illumination light L to the observation look like the above, When the transmitted light L1 which penetrated the hole pattern of the medium 10 is observed from a side on the other hand, from the long hole 13 used as the posture of the lengthwise direction of B point, a part of illumination light L penetrates as the transmitted light L1, and the illumination light L does not penetrate from the long hole 12 used as the posture of the transverse direction of C point.

[0037]Therefore, the medium 10 after rotating 90 degrees, On the other hand, the transmitted light L1 which penetrated only each long hole 13 used as the posture of the lengthwise direction is observed as a verification pattern in a side as an image (pattern), For example, the negative pattern (pattern which the streak part reversed) to the positive pattern of the picture "100" shown in drawing 4 is detected as a verification pattern.

[0038]

[Example]Below, the concrete example of this invention is described.

[0039]CO2 gas laser was used for the gift certificate which performed and formed printing etc. in the substrate 11 made of paper with a <Example 1> thickness of 100 micrometers, many long holes of the shape of a line segment 60 micrometers in width and 200 micrometers in length were regularly punched in the lengthwise direction and the transverse direction in two-dimensional array, the hole pattern was formed, and the medium with punching of this invention was obtained.

[0040]

[Effect of the Invention]As it irradiated with the illumination light and the observation look to the medium surface became [ side / medium observation-] perpendicular from the opposite hand, when a medium is regarded from the front, the medium with punching of this invention, Although the illumination light penetrates all the long holes which punched the medium, and it is observed as a regular and uniform hole pattern and it is detected such by a predetermined detection means, As the observation look to a medium surface serves as a predetermined angle (verification angle), when a medium is leaned and seen, the predetermined pattern distinguished in the lengthwise direction and the transverse direction appears as a verification pattern for judging truth.

It is effective for the forgery prevention of negotiable securities, such as a gift certificate.

[0041]Thus, a regular clearly different predetermined verification pattern is made to appear in this invention with a difference of the floodlighting direction of the irradiation light to media, such as negotiable securities which need security, the angle (verification-angle)-which-looks-at-a medium, etc.

Therefore, truth can be verified and it makes it possible to provide the high medium of a forgery prevention effect.

#### DESCRIPTION OF DRAWINGS [Brief Description of the Drawings]

[Drawing 1]The top view showing an example of the hole pattern by set of the detailed long hole in the medium with punching of this invention.

[Drawing 2]The enlarged drawing of the formation area A of the hole pattern in the medium with punching of this invention.

[Drawing 3]The sectional view of line segment X-Y in the formation area A of the hole pattern of the medium with punching of this invention.

[Drawing 4]The top view showing an example of the verification pattern which appears at the time of the hole pattern verification in the medium with punching of this invention.

#### [Description of Notations]

A -- Partial formation area of a hole pattern B -- Point C -- Point

L -- Illumination light L1 -- Transmitted light

10 -- Medium with punching 11 -- Sheet shaped substrate 12 -- Long hole of a lengthwise direction

13 -- Lateral long hole

20 -- Verification pattern 21 -- Point source which penetrated the long hole